



Cross Match<sup>®</sup> Technologies, Inc.

**D SCAN<sup>®</sup> AUTHENTICATOR CF<sup>™</sup>**  
**Document Authentication Reader**

**User Manual**

**Version 2.0**

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# Introduction

## Appropriate Operation

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The D SCAN® AUTHENTICATOR CF is a full color image and full page reader for the intended use of acquisition and transmission of personal and document data. The device has the capability to capture images of an entire data page of any ID document in different illuminations and to read RFID data contactless found on the RFID chip.

It is intended for the use in IT-devices area and the operation and installation must be in connection with suitable computer equipment. When operating, the electrical installation and cabling must comply with the IEC 60950 standard.

## Who should read this book

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You should read this book if you are a user and you will be operating the D SCAN AUTHENTICATOR CF document authentication reader device.

## How this book is arranged

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- **Chapter 1 “Introduction”** covers standards for the manual and describes the safety instructions. The chapter also contains a glossary of terms.
- **Chapter 2 “Installation”** describes the D SCAN AUTHENTICATOR CF and how to install the document authentication reader.
- **Chapter 3 “Starting the first time”** describes a tool that helps to perform a complete interactive diagnosis of the document authentication reader and how to create background images.
- **Chapter 4 “How to use the Authenticator CF”** describes how to use the indicators on the device to capture the best quality images.
- **Chapter 5 “Maintenance”** explains how to maintain the D SCAN AUTHENTICATOR CF.
- **Chapter 6 “Problems and Corrections”** describes the problems, causes, and corrections.
- **Chapter 7 “Customer Care and Contact Information”** explains how to get the technical support that is available from Cross Match Technologies.

## Standards

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The following standards are used in this book:

- **Bold UPPER/lower case** and *tilted* text identify important information.
- Special information can appear as a Note, Caution, Warning, or Danger.

**Note** A Note contains additional information. To ignore a note can cause a delay, but not mechanical damage or personal injury.

**Caution** A Caution contains a method to prevent data loss or damage to equipment. To ignore the caution can cause damage or data loss.

**Warning** A Warning describes an action that can cause injury or loss of life. Mechanical damage can occur.

**DANGER** A Warning describes an action or condition that causes injury or loss of life. Mechanical damage can occur.

## FCC statement

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FCC ID: WO8RJ0479

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

The power source for the AUTHENTICATOR CF must provide an output voltage of  $21 \pm 3$  V DC. The electric current range of the power supply unit must be min. 1 A and max. 7 A. Use only power supply units that comply with the class B limits of 47 CFR 15, Subpart B.

## Industry Canada

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IC: 7944A-RJ0479

This Class B digital apparatus complies with Canadian ICES-003. Operation is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

The power source for the AUTHENTICATOR CF must provide an output voltage of  $21 \pm 3$  V DC. The electric current range of the power supply unit must be min. 1 A and max. 7 A. Use only power supply units that comply with the class B limits of ICES-003.

## Statement of Compliance

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Cross Match Technologies GmbH, hereby, declares that this device is in compliance with the essential requirements and other relevant provisions of Directives 89/336/EEC and 2006/95/EC.

Declaration of Conformities may be directly obtained from Cross Match Technologies GmbH.

## Recycling information

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Cross Match Technologies recommends that customers dispose of their used computer hardware, monitors, printers and other peripherals in an environmentally sound manner. Potential methods include reuse of parts or whole products and recycling products, components and/or materials.

## WEEE Directive

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The following is the text of the Waste Electrical and Electronic Equipment (WEEE) Directive.

In the European Union, this label indicates that this product should not be disposed of with household waste. It should be deposited at an appropriate facility to enable recovery and recycling.

## Safety when operating

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This product has been designed, manufactured and tested according to international safety standards. The following general safety precautions must be observed during all phases of operation to ensure safe operation of the D SCAN AUTHENTICATOR CF. Cross Match Technologies GmbH assumes no liability for the customer's failure to comply with these requirements.

- When operating, the electrical installation and cabling must comply with the IEC 60950 standard.
- The power supply must be provided by a certified power supply unit with an output voltage of  $21 \pm 3$  V DC. The electric current range of the power supply unit must be min. 1 A and max. 7A. Use the desktop power pack which is provided with the product package.
- To connect the document reader to a computer, use a shielded USB data cable as supplied with the reader.
- The device must be operated only in a dry room. Exclude any condensation.
- The environmental temperature range is 50°F to 113°F (10°C to 45°C).

**Caution** Do not open the device. Repairs are only allowed by Cross Match Technologies. Changes or modifications not expressly approved by Cross Match Technologies could void the user's authority to operate the equipment.

- Whenever it is likely that the electrical protection has been compromised, the device and system must be made unplugged and secured against unauthorized use.
- Do not apply mechanical stress to the document contact area. Do not throw heavy objects onto it. The platen is made of glass and might be destroyed if not handled properly. A broken platen might have sharp edges, which could cause injuries.
- Do not scratch the document contact area. The platen is vulnerable to sharp metallic instruments (knives, scissors), extremely hard objects (diamonds) and also dust. Scratches may reduce the image quality and thereby lead to scanning results below the required quality specification.
- Always keep the document contact area clean. Use the recommended glass cleaner and lint-free tissue for cleaning. Do not use oily or abrasive cleaners since they might affect the platen surface quality.
- Do not pour liquids (water etc.) onto the D SCAN AUTHENTICATOR CF. The device is protected against cleaning with a damp cloth or tissue, however, it is not waterproof.

**Warning** Do not look directly into the lights of the document contact area. Maintain a required minimum distance of not less than 0.3 meters.

## Glossary

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This section contains some terms that are used in this manual.

**Table 1.1** Glossary of terms

Term	Definition
<b>Barcode</b>	A means of storing data as a pattern of lines or dots.
<b>DIN</b>	Deutsches Institut für Normung e.V. und deutsche Industrie-Norm (German Institute for Standardization and Industrial Standard Specification). Contains the fundamental standards for many products of the industry.
<b>DSE</b>	D SCAN Essentials. Base level software for the D SCAN AUTHENTICATOR CF, which runs on the external computer and support: <ul style="list-style-type: none"> <li>• USB driver</li> <li>• Low level access to available illuminations, camera, and RFID reader (APDU) via SDK</li> <li>• Human interface control</li> </ul>

**Table 1.1** Glossary of terms

Term	Definition
<b>DSM</b>	<p>D SCAN Master. Optional middleware software which supports:</p> <ul style="list-style-type: none"> <li>• High level document access (optical and RFID) including workflow support, cryptographic protocols, and OCR</li> <li>• Optional SDKs for both software levels</li> <li>• Optional document definitions for customer specific documents</li> <li>• Optional development support</li> <li>• Supports future upgrade of firmware and software</li> </ul>
<b>DSX</b>	<p>D SCAN Extensions. Optional middleware software which supports:</p> <ul style="list-style-type: none"> <li>•</li> </ul>
<b>ERZ</b>	<p>Effective Reading Zone. Fixed dimensional area, common to all MRTDs, in which the machine readable data in the MRZ can be read by document readers.</p>
<b>ePassport (eMRP or Electronically enabled MRP)</b>	<p>A machine readable passport (MRP) containing a Contactless Integrated Circuit (IC) within which is stored data from the MRP-data page, a biometric measure of the passport holder and a security object to protect the data with PKI cryptographic technology, and which conforms to the specification of Doc 9303, Part 1.</p>
<b>IATA</b>	<p>International Air Transport Association. Is an international industry trade group of airlines headquartered in Montreal, Quebec, Canada (where the ICAO also happens to be headquartered, even though they are different entities). On behalf of its Members and the entire aviation industry, IATA works to ensure that new and enhanced security measures are effective, internationally harmonized and minimize disruption to passengers and shippers.</p>
<b>ICAO Doc 9303</b>	<p>International Civil Aviation Organization. The International Civil Aviation Organization (ICAO) has taken a leading role in the creation of machine readable travel documents (MRTDs) in co-operation with the International Standardization Organization (ISO). The Standards are contained in document 9303 of the ICAO.</p>
<b>IR</b>	<p>Infrared radiation or light is an invisible electromagnetic radiation that has a longer wavelength than visible light and is detected most often by its heating effect. Infrared describes the part of the electromagnetic spectrum with wavelengths between 700 nm and 1mm. <i>Near infrared</i> light is closest in wavelength to visible light and <i>far infrared</i> is closer to the microwave region of the electromagnetic spectrum. Infrared light has many technology and physics applications.</p>

**Table 1.1** Glossary of terms

Term	Definition
<b>Kensington Security Slot</b>	<p>Also called a K-Slot or Kensington lock, is a small hole found on almost all small or portable computer and electronics equipment, particularly on expensive and relatively light ones. It is used for attaching a lock, in particular those from Kensington Computer Products Group, who are its originators.</p> <p>Locks are generally secured in place with a key or some mechanical PIN device and attached through a rubberized metal cable. The end of the cable has a small loop which allows the whole cable to be looped around a permanent object, such as a heavy table or other similar equipment, thus securing it in place.</p>
<b>LED</b>	<p>Light Emitting Diode. Semiconductor which emits light if connected to voltage.</p>
<b>MRTD</b>	<p>General Term for all Machine Readable Travel Documents. Official document issued by a State or organisation which conforms to ICAO Doc 9303 specifications and which is used by the holder for international travel (e.g. passport, visa, MRtd) and which contains mandatory eye readable data and a separate mandatory data summary in a format which is capable of being read by machine..</p>
<b>MRZ</b>	<p>Machine Readable Zone. Fixed dimensional area located on the MRTD, containing mandatory and optional data formatted for machine reading using OCR methods.</p>
<b>OCR</b>	<p>Optical Character Recognition. It is the mechanical or electronic translation of images of handwritten or typewritten text on paper into machine-editable text. It is scanned with a computer (NCI) and converted to an editable text document (CI). OCR is already being used widely in the legal profession, where searches that once required hours or days can now be accomplished in a few seconds.</p>
<b>OCR-font</b>	<p>OCR font is the term given to a set of special typeface style developed for Optical Character Readers and Optical Character Recognition software. Each character within a font will have a defined reproducible size and shape. For OCR, these are defined by ISO 1073-II and although use of OCR-B is preferred. OCR fonts are standardized and designed to be both machine and human readable. Some examples of OCR implementations include bank checks, passports, serial labels and postal mail.</p>
<b>RFID</b>	<p>Radio Frequency Identification (RFID) is a method of identifying unique items using radio waves. Typically, a reader communicates with a tag, which holds digital information in a microchip. But there are chipless forms of RFID tags that use material to reflect back a portion of the radio waves beamed at them. As well as the standard passport data already included, this can also be used to store biometric features. The basic technical specifications of the RF chip for use in passports have been standardized by the ICAO.</p>

**Table 1.1** Glossary of terms

Term	Definition
<b>Smart card</b>	<p>A smart card, chip card, or integrated circuit card (ICC), is defined as any pocket-sized card with embedded integrated circuits which can process information. The card is made of plastic, generally PVC, but sometimes ABS or polycarbonate. The card may embed a hologram or other security features to avoid counterfeiting. Smart cards are defined according to the card data read and write features and the type of chip implanted within the card. There is a wide range of options.</p> <p>The most common type of smart card is the contact Smart card where electrical contacts located on the outside of the card connect to a card reader when the card is inserted. Contact Smart cards are standardized in ISO/IEC 7816.</p> <p>Contactless smart cards employ a radio frequency (RFID) between card and reader without physical insertion of the card. Instead the card is passed along the exterior of the reader and read. Contactless Smart cards are standardized in ISO/IEC 14443.</p>
<b>UV</b>	<p>Ultraviolet (UV) light is represented in the light spectrum as light with a wavelength of 200nm to 400nm. The UV spectrum is divided into three regions: the near ultraviolet, the far ultraviolet, and the extreme ultraviolet, all of which are present in natural sunlight. These waves are invisible to the human eye.</p>
<b>VIZ</b>	<p>Visual Inspection Zone.</p> <p>Those portions of the MRTD (data page in the case of MRP) designed for visual inspection, i.e. front and back (where applicable), not defined as the MRZ.</p>





# Installation

THIS CHAPTER DESCRIBES THE D SCAN AUTHENTICATOR CF AND HOW TO INSTALL THE DOCUMENT AUTHENTICATION READER.

## D SCAN AUTHENTICATOR CF

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The compact single step full page document reader D SCAN AUTHENTICATOR CF (CF stands for **C**ompact **F**ull page) is the newest and smallest member of the D SCAN AUTHENTICATOR product family. Some of the following characteristics require additional software functions which might be contained in D SCAN Master or project specific.

The document authentication reader has the following characteristics:

- Capability to capture images of an entire data page of an ID document and to read RFID chip data contactless using a 13.56 MHz RFID Transceiver.
- Reads RFID and optical data of an ID document in one step without repositioning of the document, *One Step* scanner.
- The additionally installed card reader provides a contact interface, which allows to read the chip data of ID cards.
- Allows to check the authenticity of security elements of ID documents by comparing the differently lit images (visible, IR and UV light).
- High speed data capture and transmission using the USB 2.0 interface.
- Its single RFID antenna covers the entire document contact area, so the reading function is independent from position of the chip inside the document.
- The extra large optical scanning area allows inspection of documents without removing their protective cover.
- It can be configured to perform all scanning and checking functions in a fully automatic mode without any operator intervention.
- No moving parts and optional high-performance LED UV illumination ensure maximum reliability.
- The D SCAN AUTHENTICATOR CF complies with ISO standards and achieved excellent results in recent ICAO interoperability tests in Japan and

Singapore in 2005, and in Germany in 2006, where they were able to read all presented passports.

- The operation and display of results is controlled by a special software as well as all functions.

## Front view

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**Figure 2.1** D SCAN AUTHENTICATOR CF front view



**Figure 2.2** D SCAN AUTHENTICATOR CF instruction label

**Table 2.1** D SCAN AUTHENTICATOR CF major components

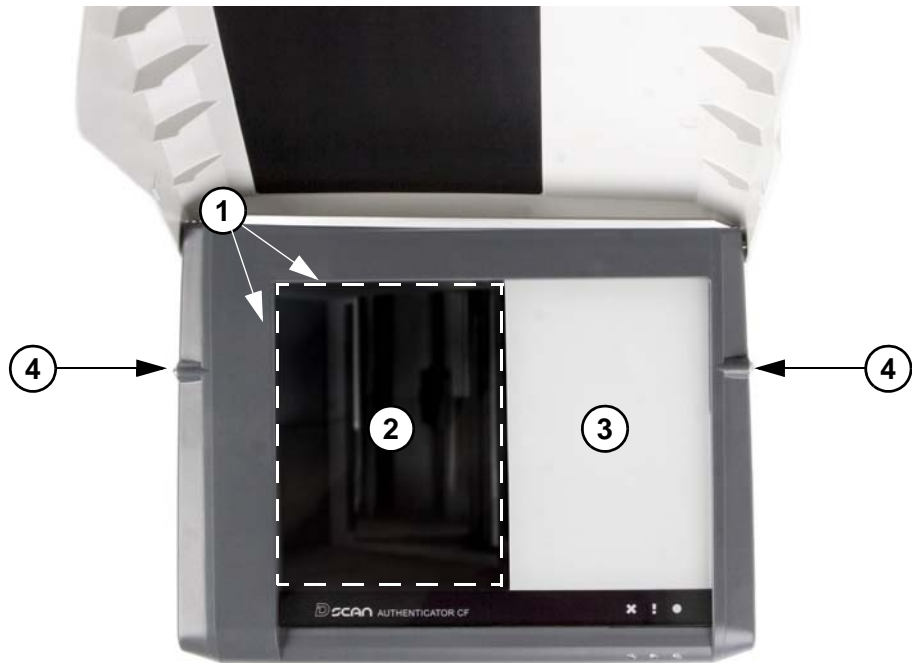
#	Description
1	<b>Ambient light cover.</b> The height adjustable cover is used as a mask to reduce outside light during operation and protects the document contact area when the device is not in use.
2	<b>Document contact area.</b> The glass bearing surface where documents are placed to be verified. It is divided into the optical scan area and the document support area. The entire document contact area is covered by the RFID antenna.
3	<b>Smart Card slot.</b> The integrated contact smart card reader allows maximum application comfort and is able to read cards according to ISO 7816 protocol Type T=0 (asynchronous half duplex character transmission protocol) and T=1 (asynchronous half duplex block transmission protocol).
4	<b>Status LEDs and Buzzer.</b> Three LEDs can provide visible indications and a volume adjustable buzzer provides acoustical indication to the user about the current mode of the document reader. Using the D SCAN Master application the LEDs light as follows: The backlit red light is the <b>Status light</b> and lights during the initialization process or when the device is not ready for operation. The backlit yellow is the <b>Processing light</b> and lights when processing a document. During this time, no other documents can be verified. After processing it turns off, indicating that a new authentication can be started. The backlit green is the <b>Operation light</b> and lights after the device is successfully initialized and when an authentication is completed. <b>Other programs can use the lights and the buzzer in different methods.</b>
5	<b>Instruction label.</b> The label informs the user in principle how to position and place a document correctly.

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## Top of the document reader

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The following section contains important details of the top of the device with a brief description of each. The ambient light cover has been opened to better show the details.



**Figure 2.3** Top view of the D SCAN AUTHENTICATOR CF

#	Description
1	<b>Document positioning angle.</b> The document positioning angle helps to guarantee the exact final position of the document for authentication.
2	<b>Optical scan area.</b> The glass bearing surface where documents are placed to be verified. A dotted line shows the area of optical reading.
3	<b>Document support area.</b> The part of the glass bearing surface which is not used for scanning. It supports positioning larger documents correctly and is also covered by the RFID antenna.
4	<b>Ball catches.</b> One ball catch is located on each side of the document contact area.

## Ambient light cover

The cover is pivoted by two bolts, one on each side, at the upper back of the D SCAN AUTHENTICATOR CF. This allows a three-point positioning, closed (1), operating (2) and opened (3). To move the cover in one of these position lift it at the front edge. Two ball catches hold the cover in the operating position.



Figure 2.4 Ambient light cover positions

## Back view

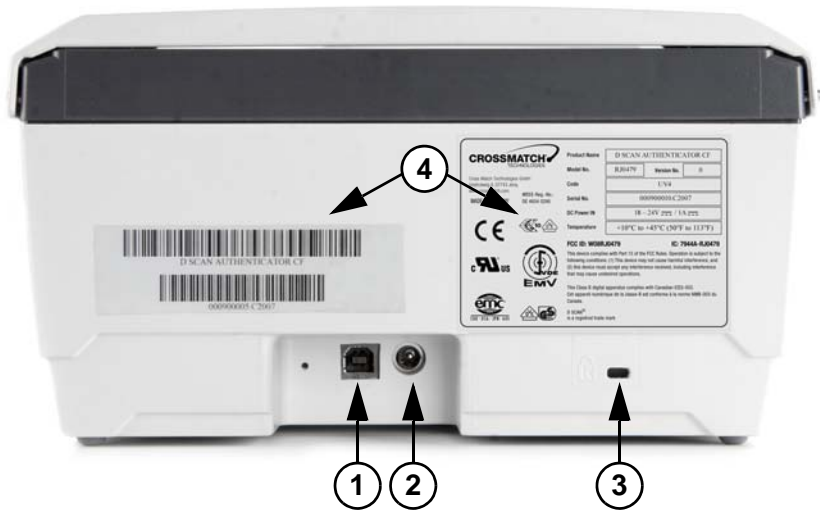


Figure 2.5 D SCAN AUTHENTICATOR CF back view

Table 2.2 D SCAN AUTHENTICATOR CF back view

#	Description
1	<b>USB-A connector.</b> The USB 2.0 high speed interface cable connects the Authenticator to the computer and delivers the reading data to the computer.
2	<b>Power connector.</b> Connects the power source to the computer and supplies 19 VDC to operate the document reader.
3	<b>Kensington security slot.</b> Used to secure the unit in place with a key and attached through a rubberized metal cable. The end of the cable has a small loop which allows the whole cable to be looped around a permanent object, such as a heavy table or other similar equipment, thus securing it in place.
4	<b>Device labels.</b> Shows manufacturer and product information.

## Product label

A label on the back of the device contains information on Manufacture, Product Name, Model Number, Code Number, Serial Number, Connection Values, FCC Compliance, CE Compliance and other Certification Symbols. The field Code can contain the abbreviation UV4, which indicates that the optionally ultraviolet illumination is installed:

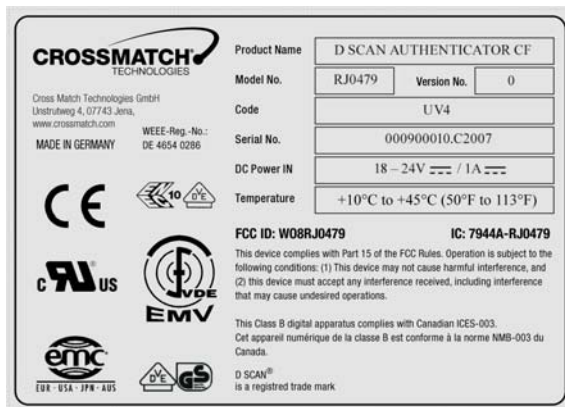


Figure 2.6 D SCAN AUTHENTICATOR CF product label

## System requirements

The D SCAN AUTHENTICATOR CF can be connected to a computer using the USB 2.0 High Speed interface. This section describes the minimum system requirements for the document reader.

### Operating system

- Windows XP Professional, Service Pack 2
- Microsoft .NET Framework 1.1 should be installed
- D SCAN Essentials Runtime

### Hardware

The minimum requirements applies to desktop and laptop computers.

- 2 GHz or higher processor with SSE2 instruction set (Intel Pentium 4 or Celeron or better, or AMD Athlon64 or better)
- 1 GB RAM
- 100 MB free hard drive space
- USB2.0-compliant ports or USB 2.0 PCI/PCMCIA card
- 1024 x 768 Video-Resolution monitor

# Installation

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This section describes how to install the D SCAN AUTHENTICATOR CF.

## Remove the contents

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**Note** Keep all original materials in the event you return the document reader.

Remove all the contents from the product package.

## List of contents

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The following items are included in the product package:

- D SCAN AUTHENTICATOR CF document authentication reader
- External power supply unit
- USB A-B signal cable
- D SCAN Essentials Runtime CD
- D SCAN AUTHENTICATOR CF User Manual on CD
- White/yellow test chart (creation of background images ????)

## Prepare to use

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Make sure that the following conditions exist before you use the D SCAN AUTHENTICATOR CF.

- After transportation or storage at low temperature, allow the reader to adjust to the temperature at the location of operation.
- Store the document reader in a warm dry location.
- The product is on a level surface.
- The surface of the document contact area is clean and dry.
- Protect the document reader from dust and humidity.
- Keep all sharp and pointed objects away from the document contact area surface.

## Connect the Authenticator CF

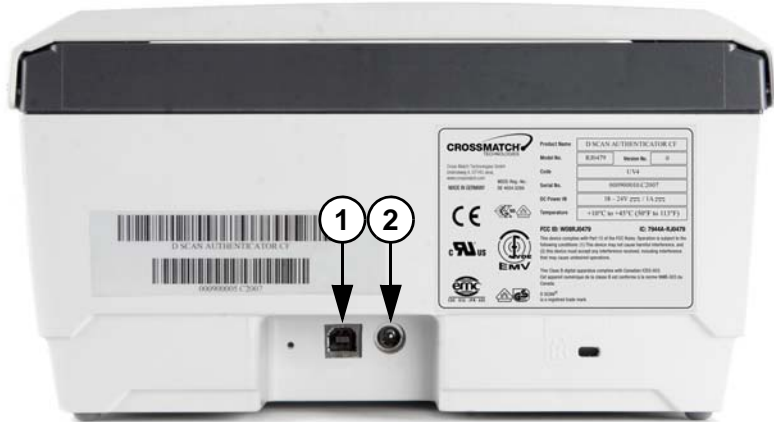
---

**Note** Before you begin, ensure that the device reached room temperature before powering on the device. The procedure applies to desktop and laptop computers.

The connectors are on a connection box at the back of the device. Use the following procedure to install the D SCAN AUTHENTICATOR CF USB and power cables.

- 1 Put the device on a clean flat area like a table, that is free of dust.
- 2 Slightly lift the back of the device. You see the connection box with the power (2) and USB (1) connectors.
- 3 Get the USB and power cables.

- 4 Insert the cable connectors into their related connectors in the connection box.



**Figure 2.7** D SCAN AUTHENTICATOR CF connection box

- 5 Connect the power supply to the AC electrical outlet.
  - All LEDs should quickly flash on and off. The orange LED comes on again flashing indicating the standby mode.

**Note** When the power is applied to the D SCAN AUTHENTICATOR CF, it is permanently powered on. Unplug the device from the AC electrical outlet, if you want to completely power-down the device.

- 6 Connect the other end of the USB cable to the USB 2.0 port of your computer.

- 7 You have completed the procedure.

**Note** Before you connect the D SCAN AUTHENTICATOR CF to the USB port of your PC you must install the D SCAN Essentials software, which copies all the required hardware driver files into the same directory, where they can be easily accessed during the D SCAN AUTHENTICATOR CF installation.

You can use any USB port when plugging in the D SCAN AUTHENTICATOR CF. However, the first time you plug the device into a particular port, Windows will install the driver for that device again. The *Found New Hardware* message is displayed in the notification area, at the far right of the taskbar or the *Found New Hardware Wizard* starts automatically.



# Starting the first time

THIS CHAPTER DESCRIBES A TOOL THAT HELPS TO PERFORM A COMPLETE INTERACTIVE DIAGNOSIS OF THE DOCUMENT AUTHENTICATION READER AND HOW TO CREATE BACKGROUND IMAGES.

Separate software tools that support the identification and diagnosis of technical problems are provided as part of the D SCAN Essentials software packages.

The D SCAN TestWizard tool can be used for both to complete an interactive diagnosis of the system and the document reader and to capture and save background images. It is designed for easy operation and does not require special knowledge. The program guides the user through several step-by-step diagnostic procedures.

Before you operate any D SCAN AUTHENTICATOR CF the **first time** and you install a new computer connected to the device you should perform:

- A complete diagnosis of the system and the document reader to identify that the system works properly and no installation problems occurred.
- Creating background images for the installed IR and visible light illumination to adjust the device to the conditions of the place of operation.

**Note** For a device which is returned from service you must also perform a complete diagnostic of the document reader and create new background images. Replace the previously used background images.

## System diagnosis

---

The test sequence covers test procedures start everything from the beginning, where the document reader and all driver software is not initialized yet till the end and finish when all components have been checked.

- 1 Power on the D SCAN AUTHENTICATOR CF and switch on your computer.
- 2 Start the *D SCAN TestWizard* by clicking the icon on the desktop or select Start/ProgramFiles/Cross Match Technologies/D SCAN Essentials/D SCAN TestWizard.
  - The program starts with a version information dialog. This is the starting point for every test procedure.
  - You can view the *User Guide* for this software by clicking **Help**.



Figure 3.1 D SCAN TestWizard start screen

3 Click **Start Checks...** to start the system configuration test sequence.

## Checking the system configuration

The first step in the sequence is an automatic analysis of such system resources as:

- CPU type and details,
- PC main memory (RAM),
- Operating system and File system
- Screen resolution, color depth
- and Current versions of the software components.

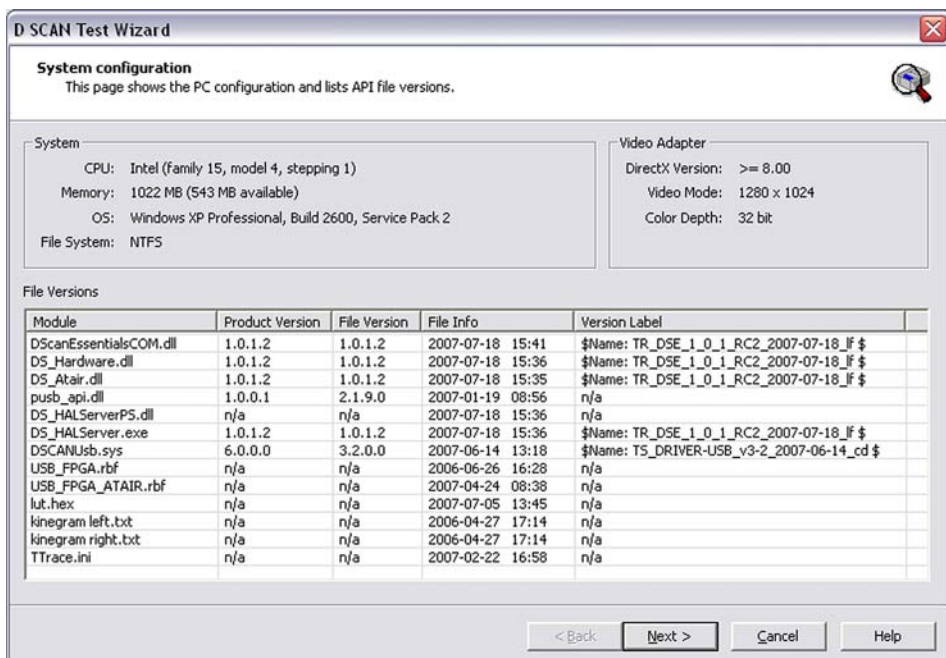


Figure 3.2 System configuration page

**Caution** This information is important to ensure the proper operation of the whole system. Especially when selecting and configuring a new PC, since incorrect resources can cause slow performance, wrong data and even crashes.

- 1 Clicking **Next** starts the *Device List* page. This page lists all detected devices connected to the PC and showing the *Device Name*, the *Serial Number*, and the available interfaces of the document reader.

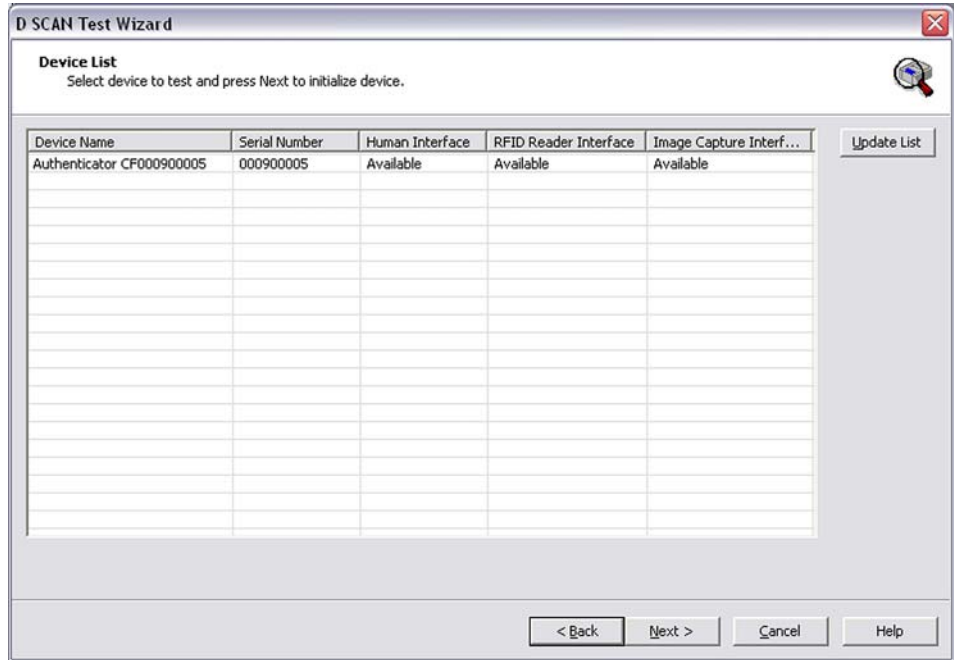


Figure 3.3 Device list page

- 2 Use the mouse cursor and **highlight** the desired device before clicking **Next** to start the initialization of the device.

- After waiting a few seconds, completion of the document reader initialization is signaled to you by displaying the *Device Overview* page.

If the initialization fails, you will see an error message that describes the nature of the problem.

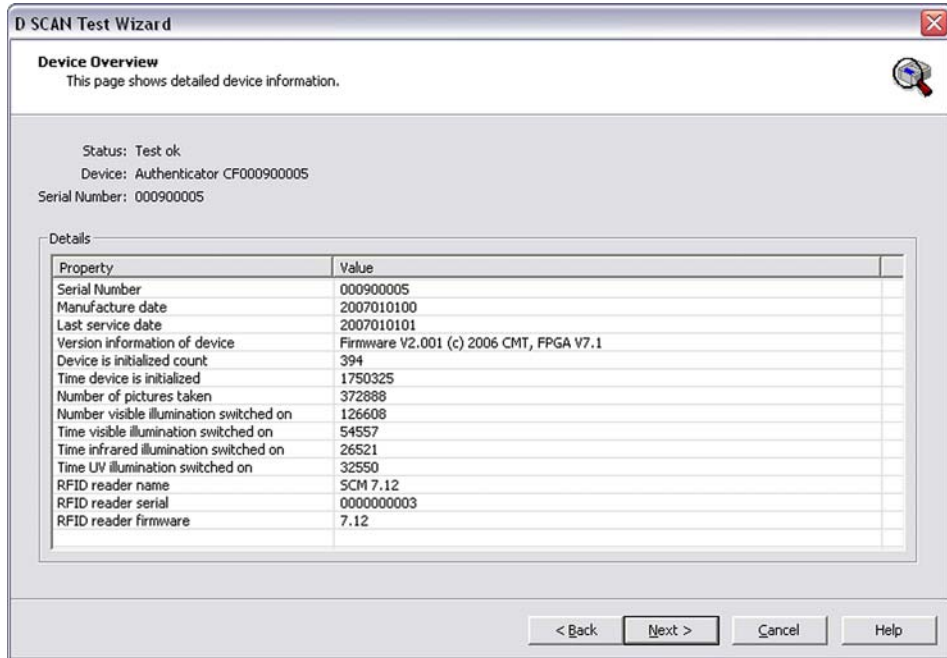
- In the case the *TestWizard* cannot find the required information in its configuration files click the button **Update**. It starts a re-scan for all USB ports of the PC. Only devices which are supported by the *D SCAN Essentials* version are listed accordingly.
- Alternatively click **Back** to return to the *System Configuration* page and repeat the device identification.

**Note** For error code definitions click **Help** and refer to the section *File List* of the help document.

## Detailed document reader information

After successful initialization, the *Device Overview* page appears, showing you the following information about the document reader connected to your computer.

- The device type, serial number and initialization status,
- Firmware and revision version,
- Production date and last service,
- Operating times and some more properties



**Figure 3.4** Device overview page

- 1 After reading this information click **Next** to start the *User Controls* page.

## Testing the user controls

The *User Controls* page shows all available user controls supported by your document reader and allows to check its LEDs and the available beeper (tunes). Because that the D SCAN AUTHENTICATOR CF has no control elements the LEDs test button is selected per default for testing.

- 1 Click **LEDs Test** to start the test procedure for the status LEDs. A default test pattern will be executed illuminating the LEDs in sequence.
- 2 To test the buzzer click **Buzzer Test**.

**Note** You must perform both tests to activate the button **Next**.

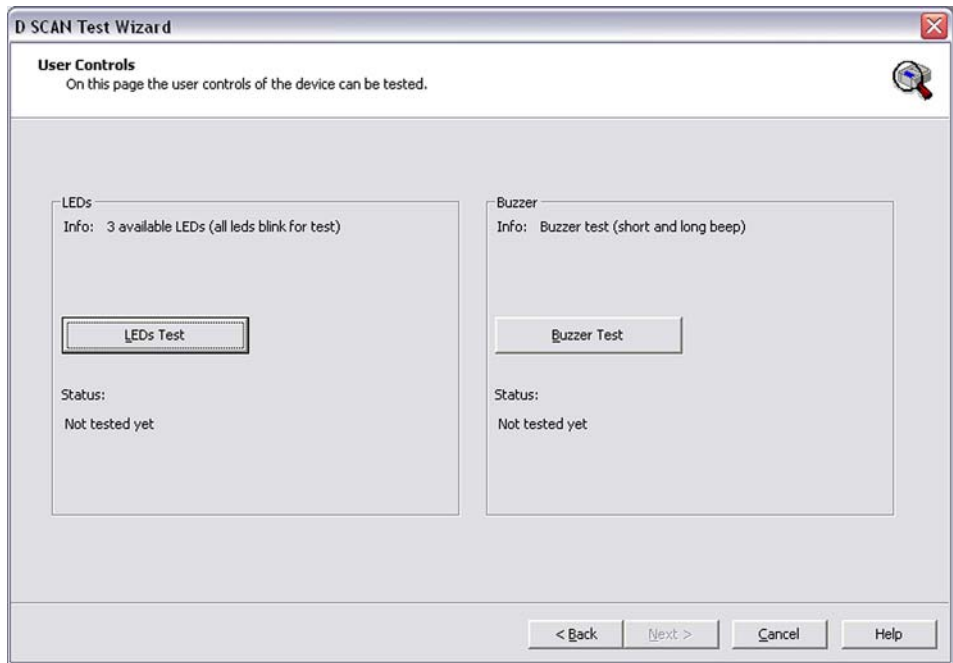


Figure 3.5 User controls page

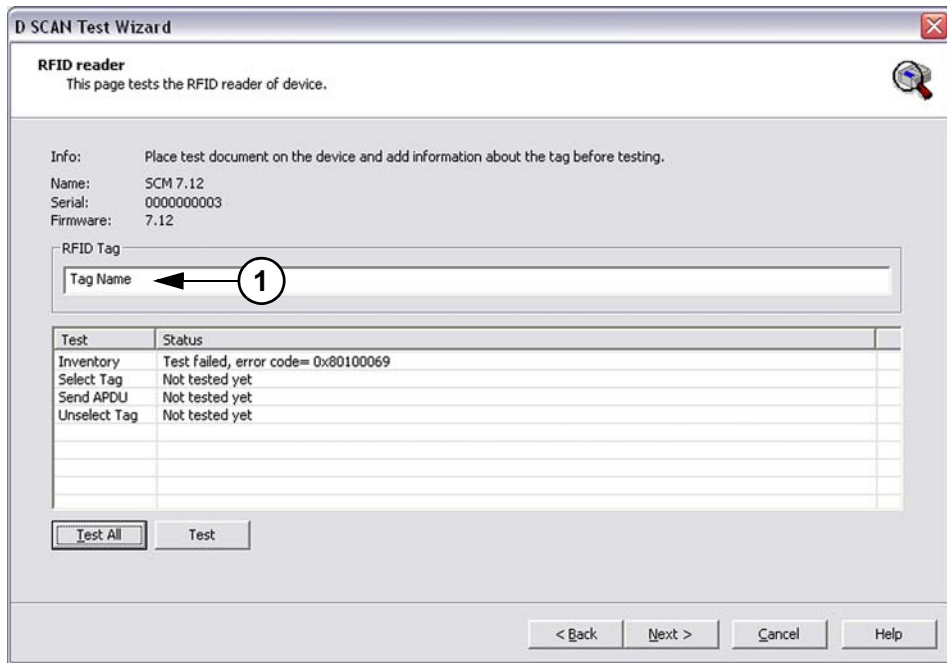
**Note** A physical defect LED or beeper cannot be detected automatically. It is necessary to observe the test patterns to identify any malfunction or defect manually. An observed malfunction should be added manually to the log file as a Comment at the Tests Completed Page.

3 Click **Next** to finish the test session. The *RFID reader* page appears.

## Testing the RFID reader

The document reader contains a RFID reader, which is able to communicate with RFID chips. By examining the document reader properties you are able to test it.

- The *RFID reader* page shows a list of all available RFID tests containing *Tests* and *Status* information.
  - The tests can be performed either as single tests separately or testing all in sequence by using the buttons **Test** or **Test All**.
- 1 Enter the *Tag Name* (1) of the document, which is placed for testing.
  - 2 Testing all modes is the default setting where all communication tasks will be performed. Start the test routine by clicking **Test All**.
    - The column *Status* shows which test will be performed and whether the test was successful. Not successfully tests displaying an error number.
    - Experienced users are able to perform single tests. To do so, highlight the desired test item using the mouse cursor and click the button **Test** to start the test.



**Figure 3.6** RFID reader test page

- 3 After completing click **Next** to continue the test session. The *Image Acquisition* page appears.

## Testing the reader unit

The document reader contains a digital camera, which is able to work for capturing images with different illuminations. By examining the document reader properties you are able to test all supported image types.

- The *Image Acquisition* page shows a list of all available image types containing the *Test*, the *Image ID*, and *Test Status* information.
- At the top of the list some important information are shown concerning the test procedure and where the test images can be saved. To change the default location click **Select Folder (1)** and choose the location where the images are to be stored. The test images may be required for the technical support department to correct problems.
- The tests can be performed either as single tests for each image type separately by using the button **Test** or testing all capture modes in sequence using **Test All**. For single tests highlight the desired capture mode using the mouse cursor.
- Double-clicking a test image in the list opens the implemented image viewer allowing you to check the image quality.

**Note** Before testing the capture modes clean the glass platen of the document reader. A clean platen is required for proper operation.

- The column *Status* shows which capture mode will be tested and whether the test was successful. Not successfully tests displaying an alphanumerical information.

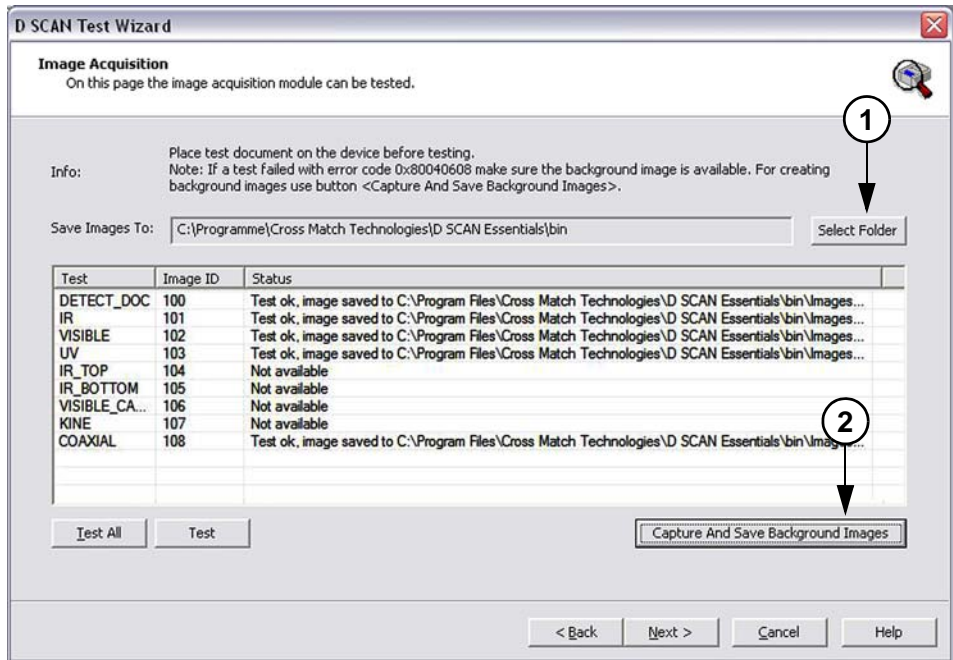


Figure 3.7 Image acquisition page

- Clicking the button **Capture and Save Background Images** (2) at the right side below the list opens a separate page. This page allows capturing and saving background images. The list shows all supported image types and the status of the tests.

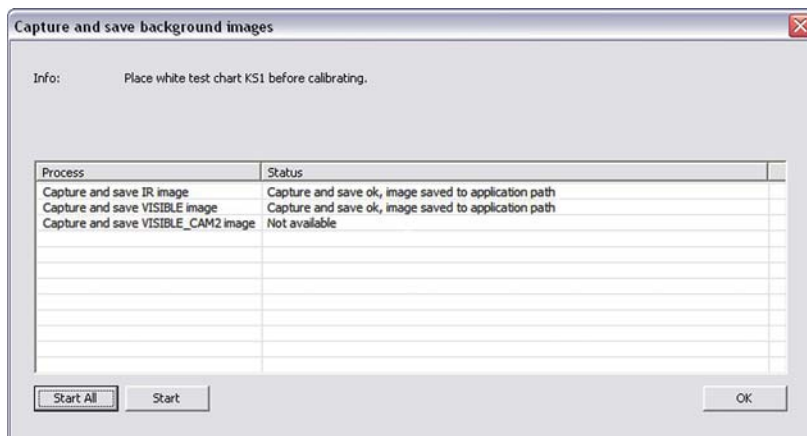


Figure 3.8 Capture and save image page

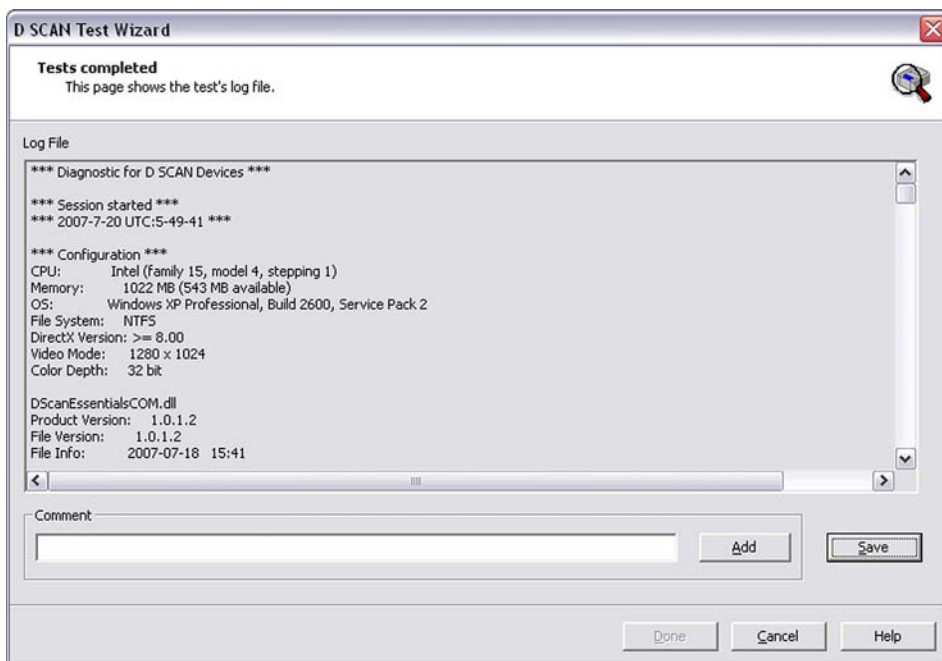
- Using the function buttons is similar to the procedures described above for the **Test** buttons.
- For more details how to create background images see section “**Creating background images**” on page 3-9.
- To close the *Capture and Save* page click OK.
- After completing all tests click **Next** to finish the test session. The *Tests Completed* page appears.

## Using the generated log

All results retrieved from the system during these tests are displayed on the *Tests Completed* page in a text window, and are also stored in a log file. This log file must be stored on the system or on removable media.

This log file is important to understand the status and symptoms of a possibly defective document reader, especially when trying to solve problems using remote support.

- 1 At the bottom of this page the box *Comments* is located. Enter any individual remarks or observed malfunction in this box and click the button **Add**. This writes the comment to the end of the log file.



**Figure 3.9** Tests completed page

- 2 Click **Save**, enter a file name and choose the location where the log file is to be stored.
- 3 Click **Done** closes the *Tests Completed* page and moves to the *Test Wizard Startup* screen.



**4** Click **Exit** to close the *D SCAN TestWizard*.

The service technician must save this log file to send it to the responsible service or support center. This log file also contains the document reader serial number and the firmware version number.

These two pieces of information are among the most important for tracking problems. If the document reader cannot be operated (for example, due to a defective power supply), then the service person must record the serial number from the document reader's back side manually.

## Creating background images

---

The background correction images created during the factory calibration of the device cannot be stored into the device. Therefore it is necessary to create background images at the place of the intended operation for each D SCAN AUTHENTICATOR CF device.

Creating background images is required when:

- A new or returned from service D SCAN AUTHENTICATOR CF device will be installed at the place of operation.
- The computer where the D SCAN AUTHENTICATOR CF is connected will be replaced by an other or a new one.
- You will operate a document reader, if it is returned from service. Replace the previously used background images.

## Preparation

---

Make sure that the following conditions exist before you perform the procedure.

- Clean the document contact area of the D SCAN AUTHENTICATOR CF and allow the surface to dry. See **“Cleaning” on page 5-1**.
- Take the test chart from the product package and keep it in place.
- Power on the D SCAN AUTHENTICATOR CF and switch on your computer.
- Start the D SCAN TestWizard and open the *Image Acquisition* page.

## Procedure

---

Use the following procedure to capture and save background images.

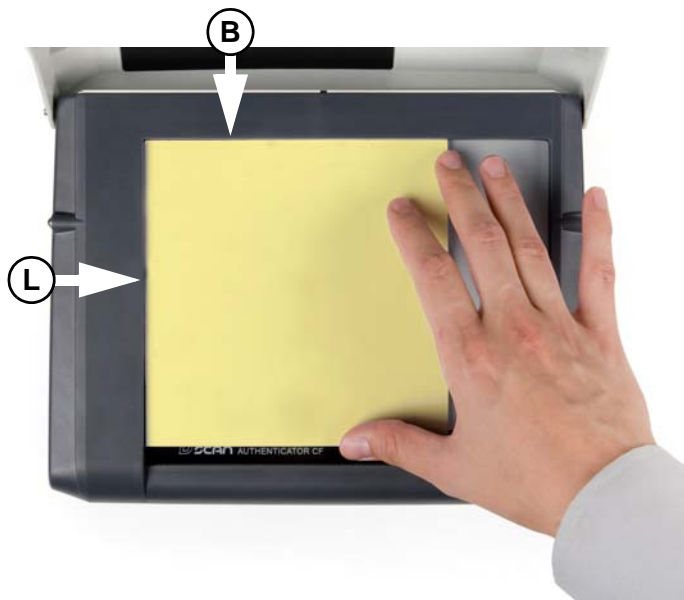
- 1** Hold the test chart by the edges.

**Note** Do not touch the white side of the test chart.



**Figure 3.10** Prepare the white test chart

- 2 Put the test chart on the document contact area so that the white side faces down to the glass platen and position it along the left (**L**) and the back (**B**) part of the document positioning angle. The yellow back side of the test chart must pointing to the top.



**Figure 3.11** Placing the white test chart

- 3 Move the ambient light cover in the operating position.
- 4 On the *Image Acquisition* page click **Capture and Save Background Images (2)**. The appearing separate page allows capturing and saving background images.

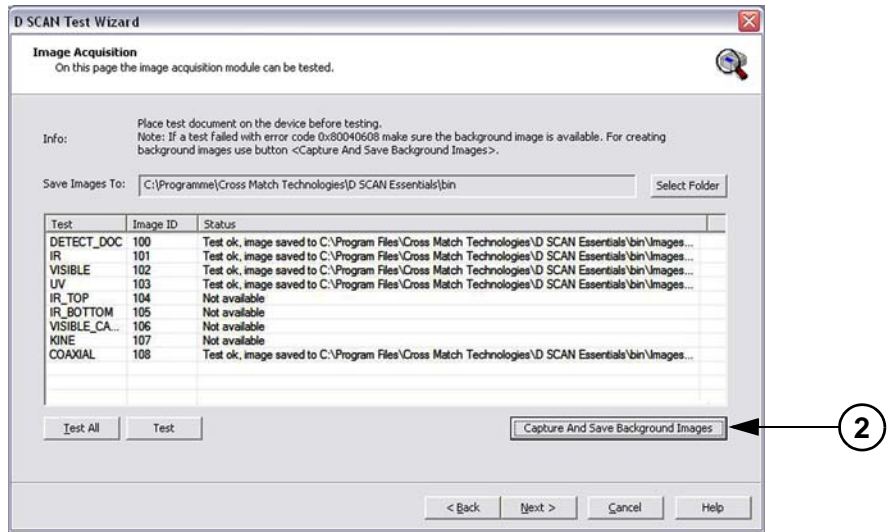


Figure 3.12 Image acquisition page

- The top of the page shows an information to remind you that the white test chart must be used.
- The background images can be performed either as single steps for each image type separately by using the button **Start** or as complete steps in sequence using **Start All**. For single steps highlight the desired image type using the mouse cursor.
- The column *Status* shows whether a saved image was successfully created.

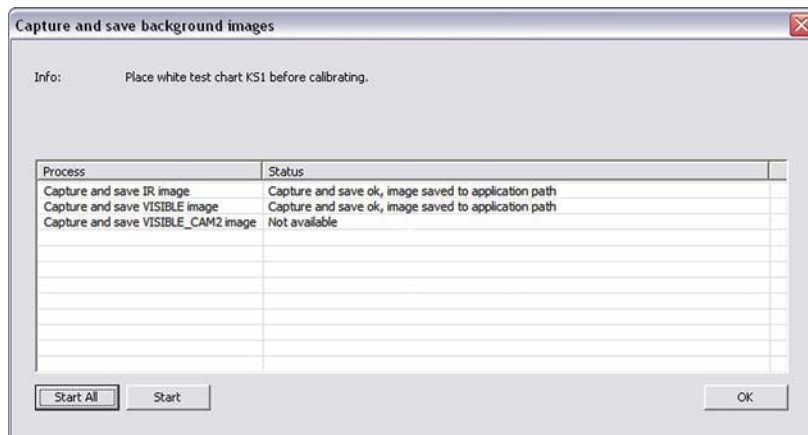


Figure 3.13 Capture and save image page

- 5 After completing click **OK** to close the page and close the TestWizard.
- 6 Remove the white test chart and store it on a save place for further use. Protect the unprotected side with a soft cloth to avoid dirt and damages.
- 7 You have completed the procedure.

The created background images are stored on the computer connected to the D SCAN AUTHENTICATOR CF in the Folder **\bin** of the D SCAN Essentials root directory using the following syntax:

S/N of the device (9 digits)\_IMT\_image type.png

(example: 000000001\_IMT\_IR.png)

**Note** Background images are related to the device for which they was created and cannot applied to other devices.

# How to use the Authenticator CF

THIS CHAPTER DESCRIBES THE FIELDS OF APPLICATION, THE CHARACTERISTICS OF DOCUMENTS AND HOW TO READ A DOCUMENT WITH THE D SCAN AUTHENTICATOR CF USING THE D SCAN MASTER DEMO APPLICATION.

## Applications and software levels

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The D SCAN AUTHENTICATOR CF is available with two software levels, the D SCAN Essentials and D SCAN Master to allow easy integration into existing systems on different levels of completeness. Each software level exists as a runtime license and a SDK license.

The D SCAN Essentials runtime software is provided for every document reader and is necessary for accessing D SCAN AUTHENTICATOR devices on a fundamental functional level for high level document authentication software from D SCAN Master series as well as for direct device access by system integrators.

D SCAN Essentials software allows low level access to the device:

- USB driver
- Illumination selection and turn on/off, image capturing, RFID reader access on APDU (Application Protocol Data Unit) level
- Human interface control (buzzer and status LEDs)
- Optional SDK recommended for system integrators with experience in document processing.

D SCAN Master software allows high level functionality:

- Business method level to access images
- Verification of security features and RFID access on data group level
- OCR functionality and internal implementations of cryptographic protocols
- ICAO Doc 9303 default document definition
- Optional SDK with tools for the implementation of protocols like BAC, EAC, PA, and AA

Using the D SCAN Master software and/or additional customized functions the following main applications, without the demand of completeness are:

#### Airports

- Airline check-in and boarding, automated check-in
- ID verification at the time of check-in
- Creation of reference data for passenger tracking
- Faster, more precise and more efficient passenger handling

#### Rental car companies

- Check-in
- Verification of ID documents
- Verification of driver's licenses
- Automated check-in for pre-registered customers

#### Banks

- Verification of ID documents
- Search against blacklists
- Transaction automation

#### Hotels

- Check-in
- Automated check-in for pre-registered guests
- Reading personal data from ID documents of guests and transmitting to authorities

#### Border control

- Automated border control
- Authentication of ID documents
- Providing reliable and efficient border control

#### Mobile Communications

- ID verification of customers
- Search against blacklists
- Contract automation

## Characteristics of documents

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General properties of Machine Readable Travel Documents are standardized in ICAO Doc 9303. This includes the structure, font, and location of the Machine Readable Zone (MRZ), MRZ check digits, and some UV properties of the document paper to be used in the document. Using the D SCAN Master software, these features are always checked, and images in all available illuminations are always captured depending on the installed hardware options.

The default document recognition and checking software (D SCAN Master) works with ICAO 9303 compliant documents of ID1, ID2, and ID3 format. A machine readable zone (MRZ) exactly as specified in Doc 9303, especially considering the OCR-B font, is required.

Additionally, documents, which are not compliant with ICAO specifications, can be detected and can be taught to the system on request.



The procedure requires usually four steps:

- 1 Find the data page.
- 2 Rotate this page in such a manner that it faces down and the MRZ (M) is pointing left.
- 3 Put the page face down on the document contact area.
- 4 Move the document along the left part of the positioning angle until it stops.
  - The accurate final position must be along the left (L) and the back (B) part of the document positioning angle.

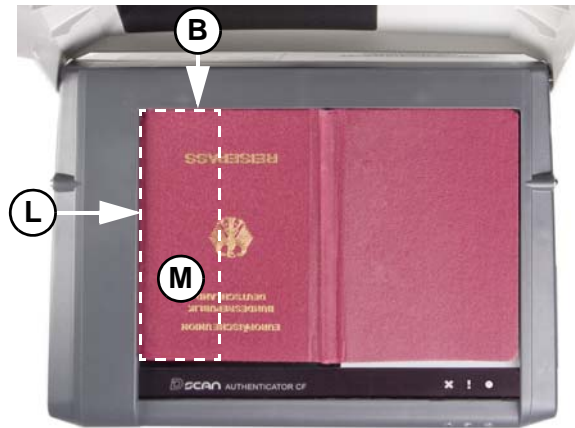


Figure 4.3 Positioning of a passport

## Read in a document

---

The following section describes a complete document reading process using the D SCAN Master Demo application as an example and explains how to use the system correctly. The operation and display of results is controlled by the software as well as all functions.

Depending on your used software and your station policy, the computer screens may differ from this example. Also the status lights can be used in different methods. However the operation of the D SCAN AUTHENTICATOR CF will always be the same.

**Note** Before a document is processed ensure that the document contact area is clean. Remove smudges, laminate glue, finger prints or other dirt that may blur the document being processed. Avoid touching the document glass with fingers prior put on a document.

The D SCAN AUTHENTICATOR CF is very easy to use and to handle:

- 1 Power on the D SCAN AUTHENTICATOR CF.
- 2 Ensure that the ambient light cover is in the operating position.
- 3 Switch on your computer.
- 4 Start the D SCAN Master Demo application. The software initializes the D SCAN AUTHENTICATOR CF and switches it to the operation mode.



- Depending on the performance of your computer, starting up can take a short moment.
- After successfully initialization the *Overview* window appears.

**Warning** Do not look directly into the lights of the document contact area. Maintain a required minimum distance of not less than 11.8 inches (0.3 m).

- Put the data page of the document to be read face down on the document contact area so that the MRZ is pointing left.
- A short acoustic signal indicates that the document is in the correct position. The processing starts automatically and the processing light is yellow.

**Note** Don't move the document until the yellow processing light turns off.

- Now you can remove the document. The yellow processing light indicates that an image was recorded and is being processed.
  - When the D SCAN AUTHENTICATOR CF has completed processing the document, the processing light turns off, the green operation light comes on and a short acoustic signal occurs.
- All data submitted to the computer are displayed on the computer screen.

## The Overview page

- The *Overview* page is the default page to show the data of the processed document. Use the **tabs** at the top to navigate and to view all data and images.

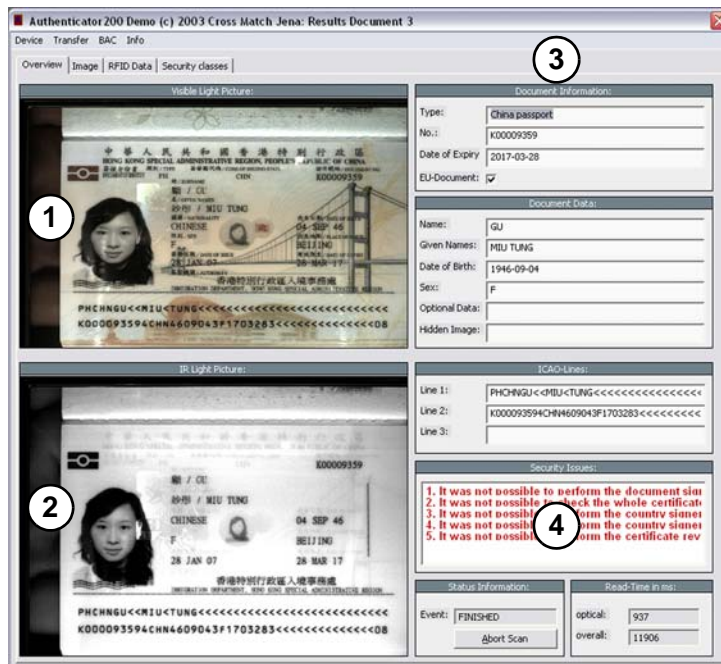


Figure 4.4 Overview page

- The left side shows both captured images. At the top the image taken with visible light (1) and below with infrared light (2).
- The right side shows the captured visible data (3), which are printed on the document.
- Additionally security information, error messages and processing information (4) are shown at the lower part on the right side. Errors or failed verifications are shown in red.
- The **Abort Scan** button allows the operator to interrupt the scanning process.

## The Images page

- 1 The **tab Images** provides the ability to show all available images in full screen resolution captured under different illuminations depending on the features installed in the D SCAN AUTHENTICATOR CF.
  - Click the **down arrow** in the *Select* box to see a list (5) containing all possible images. Chose the desired image from the list using the mouse.  
The D SCAN AUTHENTICATOR CF does not support all image types of this list. To check which image types will be supported start the D SCAN TestWizard and refer to the *Image Acquisition* page.
  - Clicking the button **Save**, stores the chosen image on your local disk.

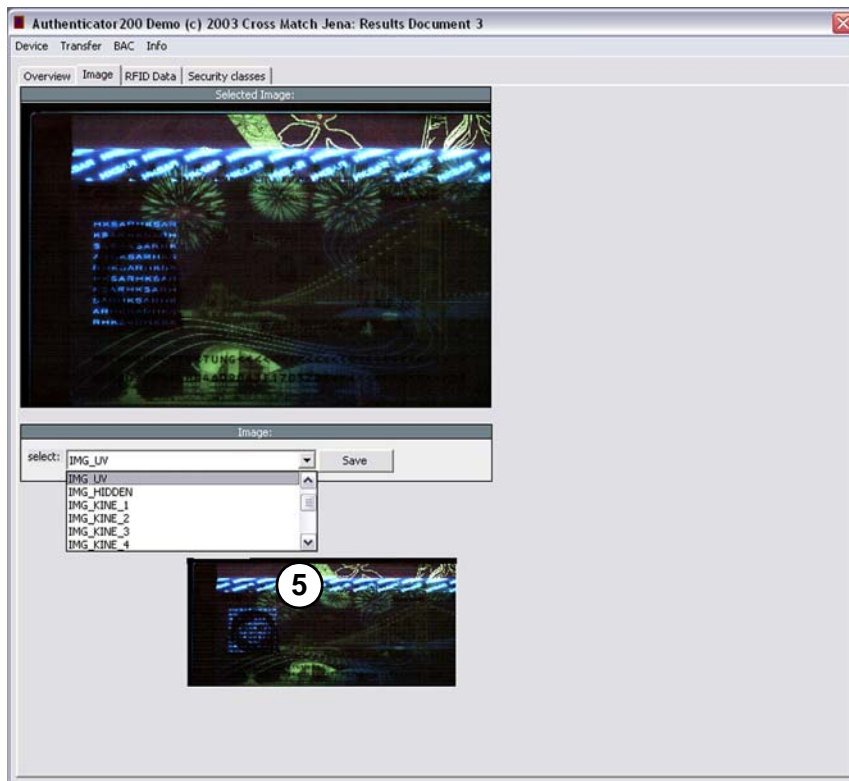
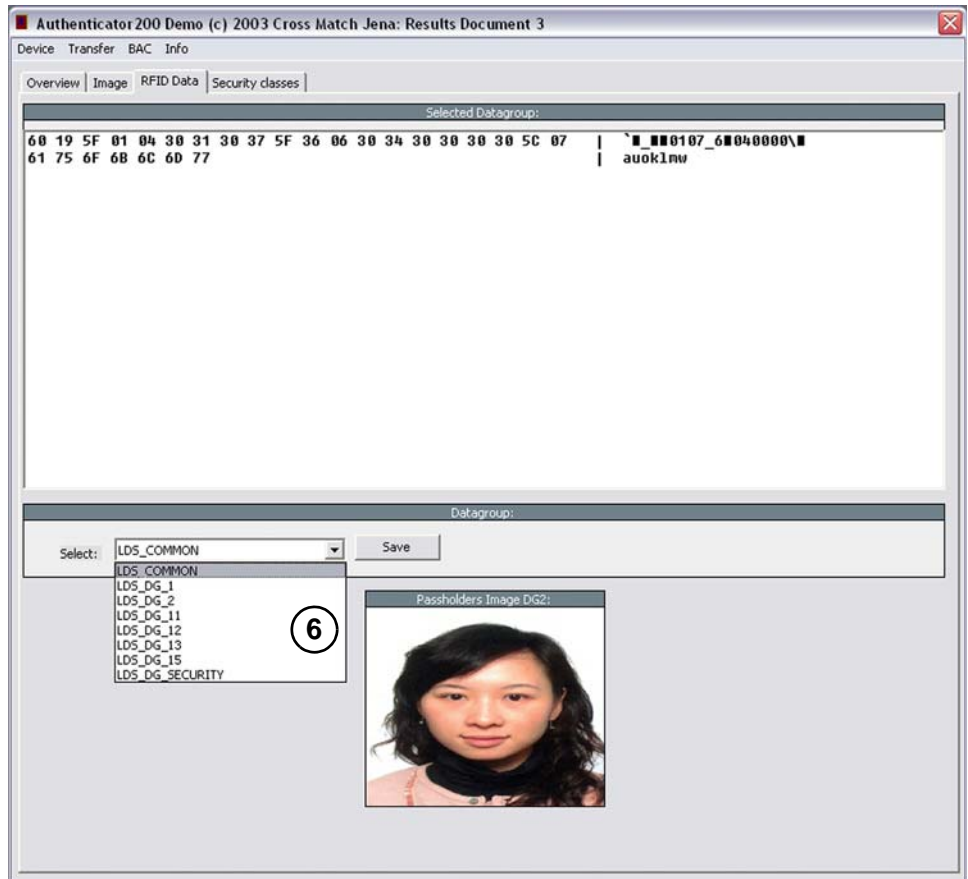


Figure 4.5 Image page

## The RFID data page

- 1 Using the **tab** *RFID Data* provides the ability to show all data groups in the Hex-Format found on the RFID chip.
  - Click the **down arrow** in the *Select* box to see a list (6) containing all data groups. Chose the desired data group from the list using the mouse. If no RFID data available the *Select box* is grayed out.
  - Clicking the button **Save**, stores the chosen data group on your local disk.



**Figure 4.6** RFID data page

In the event of mistakes during the processing, or if the processed document is not recognized, the field *Security Issues* of the *Overview* page shows the message **unknown document type**.

Repeat the operation with the same document to ensure that the problem was not caused by mispositioning the document. Correct the position by lifting-up and then repositioning the document.

The D SCAN AUTHENTICATOR CF is ready to process the next document.



# Maintenance

THIS CHAPTER DESCRIBES MAINTENANCE PROCEDURES THAT INCREASE THE LIFE OF THE DOCUMENT READER.

## Cleaning

---

This section shows and describes how to clean the document contact area and the case. A clean document contact area is required for proper operation. It prevents dirt from reducing the image quality of the processed document. Clean the platen with normal glass cleaner and make sure that no dirt, fluids or skin oils remain.

**Warning** Do not pour liquids (water etc.) onto the document reader. The document reader device is protected against cleaning with a damp cloth or tissue, however it is not waterproof.

**Caution** Do not use oil-based cleaners or abrasive cleaners.

### Cleaning the document contact area

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- 1 Spray the glass cleaner sparingly onto the document contact area.



**Figure 5.1** Clean the document contact area

- 2 With a lint-free cloth or tissue, wipe off the document contact area until clean and dry.
- 3 Ensure that the document contact area is dry before starting the reading process.

## Cleaning the case

**Warning** Before you clean the case, disconnect the D SCAN AUTHENTICATOR CF from the grounded outlet.

To remove smudges, laminate glue, finger prints or other dirt, and grime:

- 1 Take a soft, lint free cloth and put a small amount of glass cleaner on it.
- 2 Carefully wipe the case in a direction AWAY from the document contact area.

**Caution** Do not use acetone, oil-based, abrasive or other unauthorized cleaners. This may damage the device and render it inoperable. Using unapproved cleaning solutions will void the warranty.

## Specifications

**Table 5.2** Product specifications

Item	Specification
<b>Resolution</b>	Native 475 ppi sensor for best recognition of high density features
<b>Dynamic range</b>	White light and UV24 bit RGB color, IR light: 8 bit gray scale
<b>Illumination</b>	Standard: white light, IR light and coaxial light (not available in all markets) Optional: UV
<b>Document support field size</b>	5.9" x 7.4" (151 x 189 mm), document thickness is not limited
<b>Optical scan format</b>	Active size 5.3" x 3.9" (135 x 100 mm)
<b>Optical scanning time</b>	approx. 2 seconds for all images combined
<b>Supported documents</b>	Compliant with ICAO 9303 documents of ID1, ID2, and ID3 format, other ID-1, ID-2 and ID-3 documents on request
<b>Document thickness</b>	Not limited
<b>RFID chip access</b>	According to ISO 14443 Type-A and Type-B plus applicable ICAO recommendations in ICAO Doc 9303 including supplement, LDS 1.7, PKI 1.1
<b>RFID speed</b>	All standardized rates, up to 848 Kbps, read-out times depend on RFID tag, operating system, and amount of data stored in the chip
<b>Smart card reader</b>	Contact SmartCard reader with landing contacts and able to read cards according to ISO 7816 protocol Type T=0 (asynchronous half duplex character transmission protocol) and T=1 (asynchronous half duplex block transmission protocol).
<b>Environmental conditions</b>	Indoor use, climate classification according to DIN EN 60 721-3-3
<b>Temperature range</b>	50°F to 113°F (+10°C to +45°C)

**Table 5.2** Product specifications

<b>Item</b>	<b>Specification</b>
<b>Humidity range</b>	10 - 90% relative humidity, non condensing, no direct sunlight exposure
<b>Dimensions (W x D x H)</b>	10.36" x 8.35" x 5.89" (263 x 212 x 150 mm)
<b>Weight</b>	approximately 6.6 lbs (3 kg), excluding cables and power pack
<b>Interface</b>	USB 2.0 High Speed, shielded cable
<b>Power supply</b>	Rated input: 21 $\pm$ 3 V DC / min. 1 A and max. 7 A, Current used: Desktop power pack 19 V DC / < 30W, wide-range, input AC 100-240 V, 50/60 Hz
<b>Regulatory</b>	FCC, CE

---





# Problems and Corrections

THIS CHAPTER CONTAINS COMMON PROBLEMS AND STEPS TO CORRECT THEM.

Do the procedures in this section before you contact the Cross Match Technical Support department.

## The Authenticator does not work

---

### The error messages displayed:

None. However the yellow processing light is flashing.

### First actions to correct the problem

- 1 Test the electrical outlet to ensure that the electrical outlet is working.
- 2 Check the correct installation of the power supply.
- 3 Verify USB cable is firmly connected to the computer or hub.

### More actions to correct the problem

- 1 Check the correct installation of the hardware driver.
- 2 Replace the USB cable to find out if it is defective.
- 3 Contact the Technical Support department.

## Authenticator disconnected during operation

---

### The error messages displayed:

Connection broken.

The yellow processing light is flashing.

### First actions to correct the problem

- 1 Confirm the message Connection broken by clicking OK.
- 2 Re-establish the USB connection.
- 3 Re-connect the power to the Authenticator.

- 4 Initialize the Authenticator again.

### **More actions to correct the problem**

Contact the Technical Support department.

## **Initialization failed**

---

### **The error messages displayed:**

None. However the yellow processing light is on.

### **First actions to correct the problem**

- 1 Verify USB cable is firmly connected to the computer or hub.
- 2 Initialize the Authenticator again.

### **More actions to correct the problem**

- 1 Open the Windows Task Manager and close the AU\_HAL Server.exe.
- 2 Initialize the Authenticator again.
- 3 Contact the Technical Support department.

## **Dark image sections**

---

### **The error messages displayed:**

None

### **First actions to correct the problem**

- 1 Clean the processing surface.
- 2 Ensure that you have no direct light exposure shining onto the processing surface.
- 3 Verify the correct installation of all software and hardware components.

### **More actions to correct the problem**

Contact the Technical Support department.

## **Visualization and processing speed too slow**

---

### **The error messages displayed:**

None

### **First actions to correct the problem**

- 1 Verify the system requirements. See, **“System requirements” on page 2-6.**
- 2 Verify that you do not use a USB 1.1 interface port.

### **More actions to correct the problem**

Contact the Technical Support department.

## Creating a problem report

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If the steps mentioned before were unsuccessful, please use the D SCAN TestWizard to perform a complete interactive diagnostic of the system.

- 1** Start the D SCAN TestWizard.
- 2** Perform a complete system test.
- 3** Create a log file.
- 4** Save the log file.
- 5** Send the log file to the responsible Service Center.



# Customer Care and Contact Information

THIS CHAPTER CONTAINS TECHNICAL SUPPORT INFORMATION FOR THE PRODUCT AND CONTACT INFORMATION FOR THE COMPANY.

## Technical Support

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The Technical Support department is available for the D SCAN AUTHENTICATOR CF.

### E-mail

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Cross Match Customer Care offers free technical hardware support on-line during the warranty period, in the order that the requests are received.

**Table 7.1** The Technical Support department addresses

North America and South America	Europe, Africa, Asia and Australia
<a href="mailto:CustomerCare@crossmatch.com">CustomerCare@crossmatch.com</a>	<a href="mailto:Support.cmj@crossmatch.com">Support.cmj@crossmatch.com</a>

If the warranty has expired, contact Technical Support by telephone or facsimile.

### Telephone and facsimile

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Customer Care is available at the following telephone numbers:

**Table 7.2** The Technical Support department numbers

North America and South America	Europe, Africa, Asia and Australia
<b>Monday- Friday 8 am to 5:30 pm EST</b>	<b>Monday- Friday 8 am to 4 pm CET</b>
<b>Customer Care</b> Tel: <b>1.866.276.7761 (Toll Free)</b> Tel: 1.561.622.9210 (International) Fax: <b>1.561.622.8769</b>	<b>Manager, Customer Service</b> Tel: <b>+49 (0)3641 4297-57</b> Fax: <b>+49 (0)3641 4297-757</b>

Free technical support is available by telephone or facsimile for the D SCAN AUTHENTICATOR CF under the warranty. After the warranty has expired, technical support is available at a given cost per hour. Contact Technical Support for complete information.

The Technical Support for the software products and the services purchased from Cross Match Technologies is not included under the warranty. The Technical Support for other products is available at a given cost to the customer. Support for software development related questions is, up to a certain limit, usually included in every SDK purchase.

When you contact Technical Support, make sure that you can provide the following information:

- Company name
- Contact person
- The D SCAN AUTHENTICATOR CF serial number (found on the back of product)
- The configuration of your PC workstation or laptop
- The error messages that appear on the screen
- The log file created by the D SCAN TestWizard, the test images and the background images

## Return and repair of the Authenticator CF

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You must have an RMA number to return a D SCAN AUTHENTICATOR CF for repair or replacement. Contact the Technical Support department to request and receive an RMA number. Put the RMA number on the outside of the box and on the label.

**Table 7.3** The addresses for product returns

North America and South America	Europe, Africa, Asia and Australia
Cross Match Technologies, Inc. 3960 RCA Boulevard, Suite 6001 Palm Beach Gardens, Florida 33410 USA RMA: Rnnnn.nnnn	Cross Match Technologies GmbH Service Department Unstrutweg 4 07743 Jena Germany RMA NNNN

The product is sent to the correct department for service or replacement, then returned to the customer. Any product sent to Cross Match Technologies without an RMA number is returned.

## Delivery costs

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### The product is in the warranty period

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- The customer accepts all charges to send the product to Cross Match for service.

- Cross Match accepts all charges to return the product to the customer.

## The product is not in the warranty period

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The customer accepts all charges.

**Note** You must return a product in the original boxes. If the original boxes are not available, contact the Technical Support department for instructions.

## Contact information

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### Corporate Headquarters

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Cross Match Technologies, Inc.  
3950 RCA Boulevard, Suite 5001  
Palm Beach Gardens, FL 33410  
USA

T: +1 (561) 622-1650

F: +1 (561) 622-9938

T: (866) 725-3926 (Toll Free)

**General Mailbox:** [info@crossmatch.com](mailto:info@crossmatch.com)

**Sales Department:** [sales@crossmatch.com](mailto:sales@crossmatch.com)

**Technical Support:** [CustomerCare@crossmatch.com](mailto:CustomerCare@crossmatch.com)

### IGerman Operations

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Cross Match Technologies GmbH  
Unstrutweg 4  
07743 Jena  
Germany

T: +49 (0)3641 4297-0

F: +49 (0)3641 4297-14

**Sales Department:** [international-sales@crossmatch.com](mailto:international-sales@crossmatch.com)

(Sales EMEA, Asia & Pacific)

**Technical Support:** [Support.cmj@crossmatch.com](mailto:Support.cmj@crossmatch.com)

### Corporate Web Page

[www.crossmatch.com](http://www.crossmatch.com)





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